American Community Survey Design and Methodology (January 2014)

Chapter 3: Frame Development

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Chapter 3: Frame Development

3.1 Overview

The Master Address File (MAF) is the Census Bureau's official inventory of known housing units (HUs), group quarters (GQs), and selected non-residential units (public, private, and commercial) in the United States and Puerto Rico. It serves as the source of addresses for the American Community Survey (ACS), other Census Bureau demographic surveys, and the decennial census. It contains mailing and location address information, geocodes, and other attribute information about each living quarter. A geocoded address is one for which state, county, census tract, and block have been identified.

The MAF is linked to the Topologically Integrated Geographic Encoding and Referencing (TIGER) system. TIGER is a database containing a digital representation of all census-required map features and related attributes. It is a resource for the production of maps, data tabulation, and the automated assignment of addresses to geographic locations in geocoding. The resulting database is called the MAF/TIGER database (MTdb).

The initial MAF was created for Census 2000 using multiple sources, including the 1990 Address Control File, the U.S. Postal Service's (USPS's) Delivery Sequence File (DSF), field listing operations, and addresses supplied by local governments through partnership programs. The MAF was used as the initial frame for the ACS, in its state of existence at the conclusion of Census 2000. Updates from nationwide 2010 Census operations were incorporated into the MTdb and were included in the ACS sampling frame in the middle of 2010. The Census Bureau continues to update the MAF using the DSF and various automated, clerical, and field operations, such as the Demographic Area Address Listing (DAAL).

The remainder of this chapter provides detailed information on the development of the ACS sampling frame. Section 3.2 provides basic information about the MAF and its content. Sections 3.3 and 3.4 describe the MAF development and update activities for HUs in the United States and Puerto Rico. Section 3.5 describes the MAF development and update activities for GQs. Finally, Section 3.6 describes the ACS extracts from the MAF.

3.2 Master Address File Content

The MAF is the Census Bureau's official inventory of known HUs and GQs in the United States and Puerto Rico. Each HU and GQ is represented by a separate MAF record that contains some or all of the following information: geographic codes, a mailing and/or location address, the physical characteristics and/or location description of the unit or any relationships to other units, residential or commercial status, latitude and longitude coordinates, and source and history information indicating the operation(s) that added/updated the record (see Section 3.3). ACS obtains this information from the MAF in files called MAF extracts (see Section 3.6) and uses it for sampling, data collection, and data tabulation activities.

The geographic codes in the MTdb identify a variety of areas, including states, counties, county subdivisions, places, American Indian areas, Alaska Native areas, Hawaiian Homelands, census tracts, block groups, and blocks. Two important geographic code sets are the 2010 Census tabulation geography set, based on the January 1, 2010 legal boundaries, and the current geography set, based on the January 1 legal boundaries of the most recent year (for example, MAF extracts received in July 2012 reflect legal boundaries as of January 1, 2012). Each MAF record contains geographic codes from the TIGER database. Because each record contains a variety of geographic codes, it is possible to sort MAF records according to different geographic hierarchies. ACS operations generally require sorting by state, county, census tract, and block.

The MAF contains both city-style and non-city-style mailing addresses. A city-style address is one that uses a structure number and street name format; for example, 201 Main Street, Anytown, ST 99988. Additionally, city-style addresses usually appear in a numeric sequence along a street and frequently follow parity conventions, such as all odd numbers occurring on one side of the street and even numbers on the other side. They often contain information used to uniquely identify individual units in multiple-unit structures, such as apartment buildings or rooming houses. These are known as unit designators, and are part of the mailing address.

A non-city-style mailing address is one that uses a rural route and box number format or a post office (PO) box format. Examples of these types of addresses are RR 2, Box 9999, Anytown, ST 99988 and PO Box 123, Anytown, ST 99988.

In the United States, city-style addresses are most prevalent in urban and suburban areas, and accounted for 98.2 percent of all residential addresses in the MAF at the conclusion of the 2010 Census. Most city-style addresses represent both the mailing and location addresses of the unit. City-style addresses are not always mailing addresses, however. Some residents at city-style addresses receive their mail at those addresses, while others use non-city-style addresses (U.S. Census Bureau 2000b). For example, a resident could have a location address of 77 West St. and a mailing address of P.O. Box 123. In other cases, city-style addresses (“E-911 addresses”) have been established so that state emergency service providers can find a house even though mail is delivered to a rural route and box number.

Non-city-style mailing addresses are prevalent in rural areas and represented approximately 0.3 percent of all residential addresses in the MAF at the conclusion of the 2010 Census. Because these addresses do not provide specific information about the location of a unit, finding a rural route and box number address in the field can be difficult. Post Office Box addresses cannot be located in the field because they are associated with a post office location, not a structure location.

To help field staff locate non-city-style addresses in the field, the MAF often contains a location description[1] of the unit and/or its latitude and longitude coordinates. The presence of this information in the MAF makes field follow-up operations possible.

Both city-style and non-city-style addresses can be either residential or non-residential. A residential address represents a housing unit in which a person or persons live or could live. A non-residential address represents a structure, or a unit within a structure, that is used for a purpose other than residence. While the MAF includes many non-residential addresses, it is not a comprehensive source of such addresses (U.S. Census Bureau 2000b).

The MAF also contains some address records that are classified as incomplete because they lack a complete city-style or non-city-style address. Records in this category often are just a description of the unit's location, and usually its latitude and longitude. This incomplete category accounted for the remaining 1.5 percent of the United States residential addresses in the MAF at the conclusion of the 2010 Census.

For more information on the MAF, including a description of its content and structure, see U.S. Census Bureau (2000b).

3.3 Master Address File Development and Updating for the U.S. Housing Unit Inventory

MAF Development in the United States

For the 1990 and earlier decennial censuses, the Census Bureau compiled address lists from several sources (commercial vendors, field listings, and others). Before 1990, these lists were not maintained or updated after a census was completed. Following the 1990 Census, the Census Bureau decided to develop and maintain a master address list to support the decennial census and other Census Bureau survey programs in order to avoid the need to rebuild the address list prior to each census.

The Census Bureau created the MAF by merging city-style addresses from the 1990 Address Control File;[2] field listing operations;[3] the USPS's DSF; and addresses supplied by local governments through partnership programs, such as the Local Update of Census Addresses

[1] For example, "E side of St. Hwy, white house with green trim, garage on left side."

[2] The Address Control File is the residential address list used in the 1990 Census to label questionnaires, control the mail response check-in operation, and determine the response follow-up workload (U.S. Census Bureau 2000a, p. XVII-1).

[3] In areas where addresses were predominantly non-city-style, the Census Bureau created address lists through a door-to-door canvassing operation (U.S. Census Bureau 2000a, p. VI-2).

(LUCA)[4] and other Census 2000 activities, including the Be Counted Campaign.[5] At the conclusion of Census 2000, the MAF contained a complete inventory of known HUs nationwide.

For details on the address list development for Census 2000, see U.S. Census Bureau (2000a).

MAF Improvement Activities and Operations

MAF maintenance is an ongoing and complex task. New HUs are built continually, older units are demolished, and the institution of addressing schemes to allow emergency response personnel to find HUs with non-city mailing addresses render many older addresses obsolete. Maintenance of the MAF occurs through a coordinated combination of automated, clerical, and field operations designed to improve existing MAF records and keep up with the nation's changing housing stock and associated addresses. With the completion of Census 2000, the Census Bureau implemented several short-term and one-time operations to improve the quality of the MAF. These operations included Count Question Resolution (CQR), MAF/TIGER reconciliation, and address corrections from rural directories. For the most part, the Census Bureau implemented these operations to improve the addresses recognized in Census 2000 and their associated characteristics. CQR was implemented again after the 2010 Census.

The 2010 Census operations improved the coverage and quality of the MAF. The operations included several nationwide field canvassing and enumeration operations. In preparation for the 2010 Census, the Census Bureau implemented a nationwide address canvassing field operation (with the exception of remote areas in Alaska and rural Maine) to update the housing unit inventory in the MAF. Other field operations to support the 2010 Census enumeration identified HU and GQ corrections, additions, and deletions and updated the MAF with those results. Additionally, the Census Bureau repeated the same partnership and count coverage programs used for Census 2000 for the 2010 Census, including the LUCA[6] and the Be Counted programs. The Census Bureau determined the final 2010 Census status of each HU record in the MAF in

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[4] The 1999 phase of the LUCA program occurred from early March through mid-May 1999 and involved thousands of local and tribal governments that reviewed more than 10 million addresses. The program was intended to cover more than 85 percent of the living quarter addresses in the United States in advance of Census 2000. The Census Bureau validated the results of the local or tribal changes by rechecking Census 2000 address list for all blocks in which the participating governments questioned the number of living quarter addresses.

[5] The Be Counted program provided a means to include in Census 2000 those people who may not have received a Census questionnaire or believed they were not included on one. The program also provided an opportunity for people who had no usual address on Census Day to be counted. The Be Counted forms were available in English, Spanish, Chinese, Korean, Tagalog, and Vietnamese. For more information, see Carter (2001).

[6] The Census Bureau redesigned the LUCA program for the 2010 Census, allowing participants a choice of several methods of reviewing the census address or housing unit inventories in their jurisdictions. Participant feedback was included in the Address Canvassing field operation for verification.

late 2010. These operations improved the MAF extracts used for the ACS sample selection. ACS and the 2010 Census planners worked together closely to assess the impact of the decennial operations on the ACS. For details on the 2010 Census operations, see U.S. Census Bureau (2011).

Some ongoing improvement operations are designed to deal with errors remaining from the 2010 Census, while others aim to keep pace with post-2010 Census address development. In the remainder of this section, we discuss several ongoing operations, including DSF updates, ACS nonresponse follow-up updates, the Geographic Support System Initiative, and Demographic Area Address Listing (DAAL) updates. We also discuss the Community Address Updating System (CAUS), which the Census Bureau employs in rural areas. Table 3-1 summarizes the development and improvement activities.

Table 3-1: Master Address File Development and Improvement

Initial Input (2000 and earlier)	Improvements (Post-2000)
1990 Decennial Census address control file	DSF updates
USPS Delivery Sequence File (DSF)	ACS personal visit
Local government updates	Community Address Updating System (CAUS)
Other Census 2000 activities	Demographic Area Address Listing (DAAL) Operations
	2010 Census field operations
	Other 2010 Census activities
	Geographic Support System Initiative

Delivery Sequence File (DSF)

The DSF is the USPS's master list of all delivery-point addresses served by postal carriers. The file contains specific data coded for each record, a standardized address and ZIP code, and codes that indicate how the address is served by mail delivery (for example, carrier route and the sequential order in which the address is serviced on that route). The DSF record for a particular address also includes a code for delivery type that indicates whether the address is business or residential. The DSF is the primary source of new city-style-addresses used to update the MAF between decennial censuses. DSF addresses are not used for updating non-city style addresses in

the MAF, because those addresses might provide different (and unmatchable) address representations for HUs whose addresses already exist in the MAF. New versions of the DSF are shared with the Census Bureau twice a year, and updates or "refreshes" to the MAF are made at those times.

When DSF updates do not match an existing MAF record, a new record is created in the MAF. These new records, which could be new housing units, are then compared to the USPS Locatable Address Conversion Service (LACS), which indicates whether the new record is merely an address change or is new housing. In this way, the process can identify duplicate records for the same address.

For additional details on the MAF update process via the DSF, see Hilts (2005).

Address Updates from ACS Personal Visit

Field representatives (FRs) can obtain address updates or corrections for each HU visited during the personal visit phase of the ACS. The ACS conducts this follow-up for a sample of addresses. The Census Bureau updates the MAF to reflect these corrections.

For additional details on the MAF update process for ACS updates collected at time of interview, see Hanks, et al. (2008).

Demographic Area Address Listing (DAAL)

DAAL is a combination of operations, systems, and procedures associated with coverage improvement, address list development, and automated listing for the CAUS and the demographic household surveys. The objective of DAAL is to update the inventory of HUs, GQs, and street features in preparation for sample selection for the ACS and surveys such as the Current Population Survey (CPS), the American Housing Survey (AHS), and the Survey of Income and Program Participation (SIPP).

In a listing operation such as DAAL, a defined land area—usually a census tabulation block—is traveled in a systematic manner, while an FR records the location and address of every structure where a person lives or could live. The Census Bureau conducts listings for DAAL on laptop computers using the Automated Listing and Mapping Instrument (ALMI) software. The ALMI uses extracts from the current MTdb as inputs. Functionality in the ALMI allows users to edit, add, delete, and verify addresses, streets, and other map features; view a list of addresses associated with the selected geography; and view and denote the location of HUs on the electronic map. In October 2011, Global Positioning System (GPS) functionality was enabled in the ALMI. This functionality allowed the FRs to collect latitude and longitude coordinates for the structure. Compared to information once collected by paper and pencil, ALMI allows for the standardization of data collected through edits and defined data entry fields, standardization of field procedures, efficiencies in data transfer, and timely reflection of the address and feature updates in the MTdb. Starting in 2013, the demographic surveys are only listing in the following

13 states: Alabama, Alaska, Arkansas, Kentucky, Maine, Mississippi, Montana, New Hampshire, New Mexico, Oklahoma, Vermont, West Virginia, and Wyoming (Kennel, et al. 2011). For details on DAAL, see Perrone (2005).

Community Address Updating System (CAUS)

The Census Bureau designed the CAUS program specifically to address ACS coverage concerns. The Census Bureau recognized that the DSF, being the primary source of ACS frame updates, does not adequately account for changes in predominantly rural areas of the nation where city-style addresses generally are not used for mail delivery. An automated field data collection operation, CAUS was designed to provide a rural counterpart to the update of city-style addresses received from the DSF. It improved coverage of the ACS by (1) adding addresses that exist but do not appear in the DSF; (2) adding non-city-style addresses in the DSF that do not appear on the MAF; (3) adding addresses in the DSF that also appear in the MAF but are erroneously excluded from the ACS frame; and (4) deleting addresses that appear in the MAF but are erroneously included in the ACS frame.

Implemented in September 2003, CAUS focused its efforts on census blocks with high concentrations of non-city-style addresses and suspected growth in the HU inventory. Of the approximately 8.2 million blocks nationwide, the CAUS universe comprised the 750,000 blocks where DSF updates were not used to provide adequate coverage. The Census Bureau selected CAUS blocks by a model-based method that used information gained from previous field data collection efforts and administrative records to predict where CAUS work was needed. The CAUS program was suspended from October 2007 to March 2010 until the 2010 Census Address Canvassing and field follow-up activities were completed.

The CAUS program resumed listing activities again in April 2010. Approximately 30,000 blocks were listed from October 2010 through September 2012. Beginning in October 2012, and subject to available resources, the Census Bureau plans for the CAUS program to list approximately 1,500 blocks per year.

For details on the CAUS program and its block selection methodology, see Hartman (2009, 2011) and Schar (2012a, 2012b).

Geographic Support System Initiative

The Geography Division of the U.S. Census Bureau has already begun preparations for the 2020 Census and future surveys by initiating a broad-based geographic support system initiative. The initiative covers many aspects of geographic support for these programs, including investigating various partnering opportunities with local governments, and pursuing commercial resources and crowdsourcing, to maintain the MTdb throughout the decade.

All of these MAF improvement activities and operations contribute to the overall update of the MTdb.

3.4 Master Address File Development and Updating for Puerto Rico

The Census Bureau created an initial MAF for Puerto Rico through field listing operations. This MAF did not include mailing addresses because, in Puerto Rico, Census 2000 used an Update/Leave methodology through which a census questionnaire was delivered by an enumerator to each living quarter. The MAF update activities that took place from 2002 to 2004 were focused on developing mailing addresses, updating address information, and improving coverage through yearly updates.

MAF Development in Puerto Rico

MAF development in Puerto Rico also used Census 2000 operations as its foundation. These operations in Puerto Rico included address listing, Update/Leave, the LUCA, and the Be Counted Campaign. For details on Census 2000 for Puerto Rico, see U.S. Census Bureau (2004b).

The Census Bureau designed Census 2000 procedures and processing systems to capture, process, transfer, and store information for the conventional three-line mailing address. Mailing addresses in Puerto Rico generally incorporate the urbanization name (a geographic area roughly equivalent to a neighborhood), which creates a four-line address. Use of the urbanization name eliminates the confusion created when street names are repeated in adjacent communities. In some instances, the urbanization name is used in lieu of the street name.

The differences between the standard three-line address and the four-line format used in Puerto Rico created problems during the early MAF building stages. The resulting file structure for the Puerto Rico MAF was the same as that used for states in the United States, so it did not contain the additional fields required to handle the more complex Puerto Rico mailing address. These processing problems did not adversely impact Census 2000 operations in the U.S. because the record structure was designed to accommodate the standard U.S. three-line address. However, in Puerto Rico, where questionnaire mailout was originally planned as the primary means of collecting data, the three-line address format turned out to be problematic. As a result, it is not possible to calculate the percentage of city-style, non-city-style, and incomplete addresses in Puerto Rico from Census 2000 processes.

MAF Improvement Activities and Operations in Puerto Rico

Because of these address formatting issues, the MAF for Puerto Rico as it existed at the conclusion of Census 2000 required significant work before it could be used to fully implement the Puerto Rico Community Survey (PRCS) starting in 2005. The Census Bureau had to revise the address information in the Puerto Rico MAF. This effort involved splitting the address information into the various fields required to construct a mailing address using Puerto Rico addressing conventions.

The Census Bureau contracted for updating the list of addresses in the Puerto Rico MAF. Approximately 64,000 new Puerto Rico HUs were added to the MAF, with each address geocoded to a municipio, tract, and block. The Census Bureau also worked with the USPS DSF for Puerto Rico to extract information on new HU addresses. Matching the USPS file to the existing MAF was only partially successful because of inconsistent naming conventions, missing information in the MAF, and the existence of different house numbering schemes (USPS versus local schemes). Data collection activities for the 2005 ACS began in November 2004 with the best address information available given these shortcomings. The Census Bureau is pursuing options for the ongoing collection of address updates in Puerto Rico. This may include operations comparable to those that exist in the United States, such as DSF updates. Future versions of this document will include discussions of these operations and MAF development and updating in Puerto Rico.

As part of the MAF/TIGER redesign effort in the middle of the last decade, the Census Bureau redesigned the MAF to accommodate the Puerto Rico specific address components that were lacking previously. The MAF now accommodates these specific address components, allowing the potential to update the MAF in Puerto Rico by census field operations and other methods.

In preparation for the 2010 Census, the Census Bureau conducted address canvassing in Puerto Rico as it was in the United States, updating the inventory of housing units in the MAF for Puerto Rico prior to the 2010 Census. Results from the 2010 Census Update/Leave and follow-up operations also updated the MAF addresses in Puerto Rico. The Census Bureau determined the final 2010 Census status of each HU record in the MAF in Puerto Rico in late 2010.

3.5 Master Address File Development and Updating For Group Quarters in the United States and Puerto Rico

MAF Development for GQs

In preparation for Census 2000, the Census Bureau developed an inventory of special places (SPs) and GQs. SPs are places such as prisons, hotels, migrant farm camps, and universities. GQs are contained within SPs, and include college and university dormitories and hospital/prison wards. The SP/GQ inventory was developed using data from internal Census Bureau lists, administrative lists obtained from various federal agencies, and numerous Census 2000 operations such as address listing, block canvassing, and the SP/GQ Facility Questionnaire operation. Responses to the SP/GQ Facility Questionnaire identified GQs and any HUs associated with the SP. Similar to the HU MAF development process, local and tribal governments had an opportunity to review the SP address list. In August 2000, after the enumeration of GQ facilities, the Census Bureau incorporated the address and identification information for each GQ into the MAF.

MAF Improvement Activities and Operations for GQs

As with the HU side of the MAF, maintenance of the GQ universe is an ongoing and complex task. The earlier section on MAF Improvement Activities and Operations for HUs mentions short-term/one-time operations (such as CQR and MAF/TIGER reconciliation) that also updated GQ information. Additionally, the Census Bureau completed a GQ geocoding correction operation to fix errors (mostly census block geocodes) associated with college dormitories in the MAF and TIGER.

The Census Bureau collects information on the new GQ facilities and updated address information for existing GQ facilities on an ongoing basis by listing operations such as DAAL, which also includes the CAUS in rural areas. This information is used to update the MAF. Additionally, it is likely that DSF updates of city-style address areas are providing the Census Bureau with new GQ addresses; however, the DSF does not identify such an address as a GQ facility.

Prior to 2010 Census operations, the Census Bureau developed a process to supplement these activities to create an updated GQ universe from which to select the ACS sample. The Census Bureau constructed the ACS GQ universe by merging the updated SP/GQ inventory file, extracts from the MAF, and a file of those seasonal GQs that were closed on April 1, 2000 (but might have been open if visited at another time of year). To supplement the ACS GQ universe, the Census Bureau obtained a file of federal prisons and detention centers from the Bureau of Prisons (BoP) and a file from the Department of Defense (DoD) containing military bases and vessels. The Census Bureau also conducted research to identify new migrant worker locations, new state prisons, and state prisons that had closed.

ACS FRs, while conducting the Group Quarters Facility Questionnaire (GQFQ), collect updated address and geographic location information. Updates collected via the GQFQ were used to provide more accurate information for subsequent visits to a facility, as well as to update the ACS GQ universe. For more information about the GQFQ, see the section titled Group Quarters (Facility-Level Phase) in Section 8.2 of Chapter 8.

The Address Canvassing operation for the 2010 Census identified records as “other living quarters” or OLQs. All OLQs and GQs were then visited in the Group Quarters Validation operation where their final status as a HU or GQ was determined. GQs were then enumerated in the GQ Enumeration operation. The Census Bureau applied updates from all of these operations to the MAF. The Census Bureau determined the final 2010 Census status for each GQ in late 2010.

The final Census universe of GQs is the basis of the ACS GQ frame for 2012 and beyond. ACS also includes GQs that were identified as having no population on Census Day as those GQs may contain people if visited at another time of the year. New GQs from ongoing operations, such as DAAL and CQR, are also included in the ACS GQ frame. The Census Bureau updates the ACS

GQ frame with results from ACS GQ data collection operations as well as results of state prison research using the individual state Department of Corrections websites. ACS continues to partner with the BoP to ensure the most accurate GQ frame for federal prisons.

For more information on the post-2010 Census ACS GQ frame, see Bates (2011) and Aubuchon (2011).

3.6 American Community Survey Extracts from the Master Address File

Data from the MTdb are provided for use with the ACS in files called MAF extracts. These MAF extracts contain a subset of the data items in the MAF. The major classifications of variables included in the MAF extracts are: address variables, geocode variables, and source and status variables (see Section 3.2).

The MAF, as an inventory of living quarters (HUs and GQs) and some non-residential units, is a dynamic entity. It contains millions of addresses that reflect ongoing additions, deletions, and changes; these include current addresses, as well as those determined to no longer exist. Each Census Bureau program that relies on the MAF defines the set of valid addresses for their individual program.

Since the ACS frame must be as complete as possible, the Census Bureau applies filtering rules during the creation of the ACS extracts to minimize both overcoverage and undercoverage and to obtain an inclusive listing of addresses. For example, the ACS filter rules include units that represent new construction units, some of which may not exist yet. The ACS also includes other housing units that are not geocoded, which means that the address is one that has not been linked to a census tract and block yet. In addition, the ACS includes units that are "excluded from delivery statistics" (EDS); these units often are those under construction, i.e., the housing unit is being constructed and has an address, but the USPS is not yet delivering mail to the address. In this regard, the ACS filtering rules differ from those for the 2010 Census. For the 2010 Census, EDS records were included on the list of addresses to be updated in Address Canvassing, but ungeocoded records were excluded. Ungeocoded records and EDS records added to the MAF after Address Canvassing were excluded from all post-Address Canvassing operations.

The filter is reviewed each year and may be enhanced as the ACS learns about its sample addresses and more about the coverage and content of the MAF. For a record to be eligible for the ACS, it must meet the conditions set forth in the filter.

Filtering rules change, and with them, the ACS frame. The most significant recent change to the ACS filter was the incorporation of results from 2010 Census operations. Prior to Address Canvassing, the largest source of HUs on the ACS frame was HUs tabulated in Census 2000. Address Canvassing results were incorporated into the MAF in time to be included the ACS frame by mid-2010. Once the Census Bureau established the final 2010 Census HU universe, the basis of the ACS HU frame became the list of HUs tabulated in the 2010 Census. The post-2010 ACS frame consists of 2010 Census addresses plus any new records added to the MAF after the

2010 Census, including post-Census DSF adds, new or validated records from DAAL, CQR, special censuses, and Census tests, and 2010 Census deletes that persist on the DSF.

As discussed above, the ACS attempts to create a sampling frame that is as accurate as possible by minimizing both overcoverage and undercoverage[7]. In the process, the ACS filter rules can lead to net overcoverage, reflecting some duplicate and ineligible units. This overcoverage has been estimated to be approximately 1.9 to 5.2 percent for the years 2002- 2009. See Kephart (2010) for a discussion of this issue.

For details on the ACS requirements for MAF extracts, see Zimolzak (2012). For more information on the ACS sample selection, see Chapter 4. For a description of data collection procedures for these different kinds of addresses, see Chapters 7 and 8. For details on the MAF, its coverage, and the implications of extract rules on the ACS frame, see Shapiro and Waksberg (1999) and Kephart (2010).

[7] Definitions of the terms “overcoverage” and “undercoverage” are provided in the Glossary.

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